

Trends in the science proficiency of 9-, 13-, and 17-year-olds

Competence in science is an important outcome of education. The ability to apply scientific information, interpret data, and make inferences about scientific findings is required in a world that relies heavily on technological and scientific advances.

- In 1994, average science achievement was higher at all three age levels than in 1982. Following a period of decline in the 1970s, scores were higher at age 9 in 1994 than 1970, about the same at age 13, and lower at age 17.
- In 1994, the average science proficiency of blacks and Hispanics remained well below that of whites. However, between 1977 and 1994, the proficiency gap decreased between whites and blacks at age 9 and between whites and Hispanics at age 13.
- A higher percentage of 9-, 13-, and 17-year-olds demonstrated general science skills by reaching level 250 in 1994 than in 1982. In addition, more 17-year-olds reached levels 300 and 350 in 1994, exhibiting detailed knowledge and analytical understanding of scientific principles and the ability to integrate specialized scientific information (see supplemental table 19-2).
- There is a great deal of variation in science proficiency scores within an age group. For example, in 1994, the proficiency of white 9-year-olds varied by 123 scale points from the 5th percentile to the 95th percentile. By comparison, the difference in the proficiency of median white 9-year-olds and white 17-year-olds was 66 scale points (see supplemental table 19-3).

Average science proficiency (scale score), by sex and age: Selected years 1970–94

Year	Total			Male			Female		
	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	¹ 225	255	¹ 305	¹ 228	257	¹ 314	¹ 223	253	¹ 297
1973	^{1,2} 220	^{1,2} 250	¹ 296	^{1,2} 223	^{1,2} 252	² 304	¹ 218	^{1,2} 247	² 288
1977	^{1,2} 220	^{1,2} 247	² 290	^{1,2} 222	^{1,2} 251	² 297	^{1,2} 218	^{1,2} 244	^{1,2} 282
1982	¹ 221	^{1,2} 250	^{1,2} 283	^{1,2} 221	256	^{1,2} 292	¹ 221	^{1,2} 245	^{1,2} 275
1986	¹ 224	¹ 251	^{1,2} 288	¹ 227	256	² 295	¹ 221	^{1,2} 247	^{1,2} 282
1990	229	255	² 290	230	³ 259	² 296	227	252	² 285
1992	² 231	258	² 294	² 235	260	² 299	227	256	² 289
1994	² 231	257	² 294	² 232	259	² 300	² 230	254	² 289

Average science proficiency (scale score), by race/ethnicity and age: Selected years 1970–94

Year	White			Black			Hispanic		
	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	236	¹ 263	¹ 312	¹ 179	215	258	—	—	—
1973	^{1,2} 231	^{1,2} 259	² 304	¹ 177	^{1,2} 205	² 250	—	—	—
1977	^{1,2} 230	^{1,2} 256	^{1,2} 298	¹ 175	¹ 208	^{1,2} 240	¹ 192	¹ 213	262
1982	^{1,2} 229	^{1,2} 257	^{1,2} 293	¹ 187	217	^{1,2} 235	¹ 189	² 226	² 249
1986	^{1,2} 232	¹ 259	^{1,2} 298	² 196	222	253	199	² 226	259
1990	238	264	² 301	² 196	² 226	253	² 206	² 232	262
1992	239	² 267	² 304	² 200	224	256	² 205	² 238	270
1994	240	² 267	² 306	² 201	224	257	² 201	² 232	261

— Not available.

¹ Statistically significant difference from 1994.

² Statistically significant difference from 1970 for all racial/ethnic groups except Hispanics. Statistically significant difference from 1977 for Hispanics.

³ Revised from previously published figures.

NOTE: The science proficiency scale ranges from 0 to 500. (See supplemental table 19-1 for detailed explanations of levels.)

Level 150: Knows everyday science facts

Level 200: Understands simple scientific principles

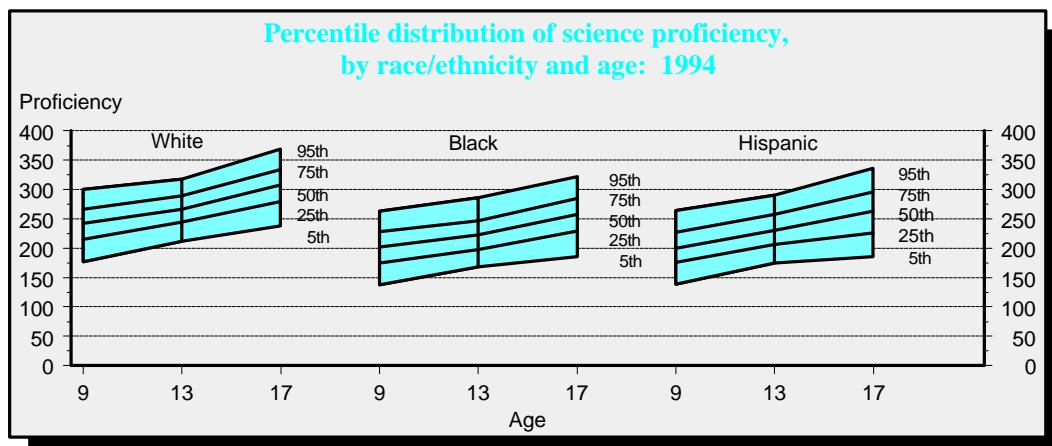
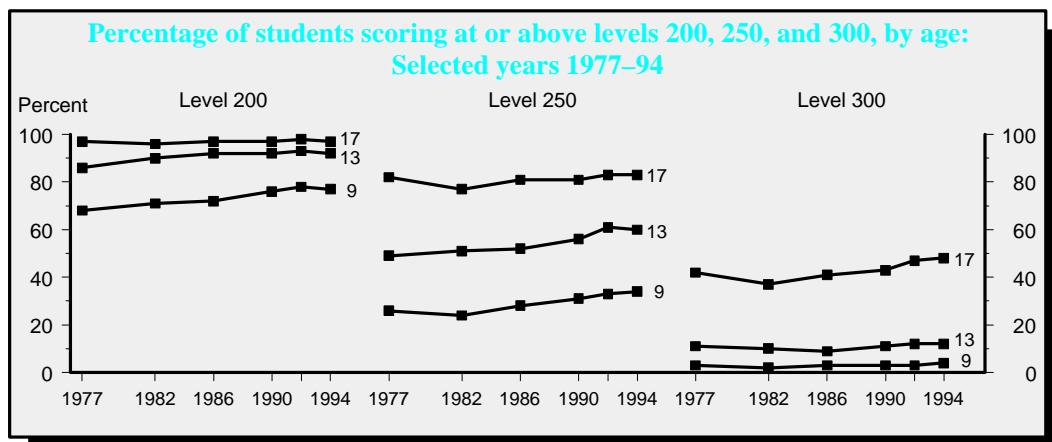
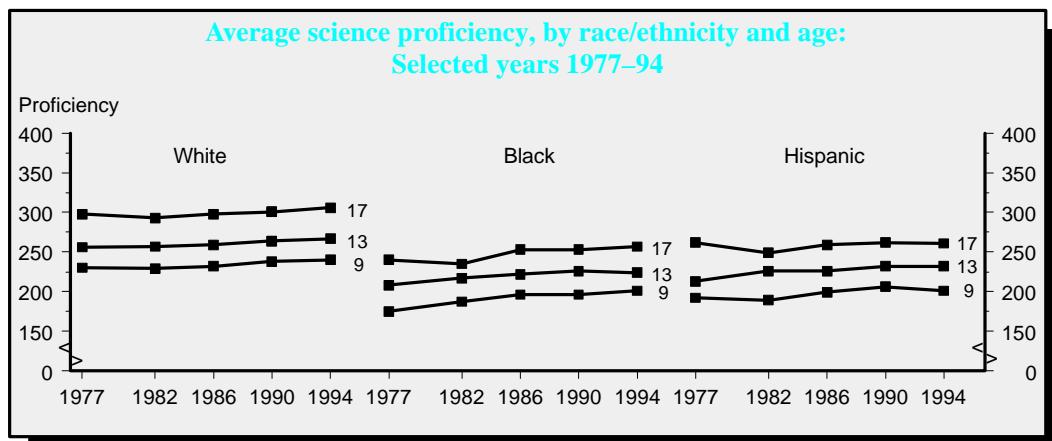
Level 250: Applies general scientific information

Level 300: Analyzes scientific procedures and data

Level 350: Integrates specialized scientific information

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; and Writing, 1984 to 1994*, 1996.

Average science proficiency (scale score)



NOTE: The science proficiency scale ranges from 0 to 500. (See supplemental table 19-1 for detailed explanations of levels.)

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994*, 1996.

Table 19-1 Explanations of levels of science proficiency**Level 350: Integrates specialized scientific information**

Students at this level can infer relationships and draw conclusions using detailed scientific knowledge from the physical sciences, particularly chemistry. They also can apply basic principles of genetics and interpret the societal implications of research in this field.

Level 300: Analyzes scientific procedures and data

Students at this level can evaluate the appropriateness of the design of an experiment. They have more detailed scientific knowledge, and the skill to apply their knowledge in interpreting information from text and graphs. These students also exhibit a growing understanding of principles from the physical sciences.

Level 250: Applies general scientific information

Students at this level can interpret data from simple tables and make inferences about the outcomes of experimental procedures. They exhibit knowledge and understanding of the life sciences, including a familiarity with some aspects of animal behavior and of ecological relationships. These students also demonstrate some knowledge of basic information from the physical sciences.

Level 200: Understands simple scientific principles

Students at this level are developing some understanding of simple scientific principles, particularly in the life sciences. For example, they exhibit some rudimentary knowledge of the structure and function of plants and animals.

Level 150: Knows everyday science facts

Students at this level know some general scientific facts of the type that could be learned from everyday experiences. They can read simple graphs, match the distinguishing characteristics of animals, and predict the operation of familiar apparatus that work according to mechanical principles.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 19/3 to 1994; Reading, 19/1 to 1994; Writing, 1984 to 1994*, 1996.

Table 19-2 Percentage of students scoring at or above five levels of science proficiency: 1977, 1982, 1986, 1990, 1992, and 1994

Proficiency level	Age	Year					
		1977	1982	1986	1990	1992	1994
Level 350:	9	0	0	0	0	0	0
Integrates specialized scientific information	13	1	0	0	0	0	0
	17	9	1	8	9	10	10
Level 300:	9	3	2	3	3	3	4
Analyzes scientific procedures and data	13	11	10	9	11	12	12
	17	42	37	41	43	47	48
Level 250:	9	26	24	28	31	33	34
Applies general scientific information	13	49	51	52	56	61	60
	17	82	71	81	81	83	83
Level 200:	9	68	71	72	76	78	77
Understands simple scientific principles	13	86	90	92	92	93	92
	17	97	96	97	97	98	97
Level 150:	9	94	95	96	97	97	97
Knows everyday science facts	13	99	100	100	100	100	100
	17	100	100	100	100	100	100

^aStatistically significant difference from 1994.

^bStatistically significant difference from 1977.

NOTE: Some scores were revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994*, 1996.

Table 19-3 Percentile distribution of science proficiency scores, by age and race/ethnicity: 1977, 1982, 1986, 1990, 1992, and 1994

Percentile	Age 9						Age 13						Age 17					
	1977	1982	1986	1990	1992	1994	1977	1982	1986	1990	1992	1994	1977	1982	1986	1990	1992	1994
All students																		
5	144	151	155	160	163	161	174	185	189	191	193	191	213	203	212	210	218	212
10	161	167	170	176	178	177	191	200	203	206	209	207	231	222	230	229	234	232
25	190	194	196	202	204	203	218	224	227	230	235	233	261	252	260	260	264	265
50	222	221	225	230	232	233	249	251	252	256	260	259	291	285	290	292	296	297
75	251	249	253	257	258	260	278	277	276	281	284	283	320	315	319	323	327	326
90	276	272	277	279	281	282	302	299	298	302	303	303	346	342	344	348	350	350
95	291	286	291	292	294	295	317	313	310	315	315	314	362	357	360	363	364	363
White																		
5	163	167	166	177	178	177	191	198	204	209	213	212	231	223	228	233	234	238
10	178	182	181	190	192	191	205	211	216	220	226	225	246	239	245	249	251	254
25	202	204	206	213	214	215	229	233	237	241	246	245	270	266	271	273	277	280
50	230	229	233	238	240	242	256	258	259	264	268	267	298	294	299	301	306	308
75	257	255	259	262	264	266	283	282	282	287	289	289	325	321	325	329	333	334
90	281	278	282	284	285	286	307	303	302	307	307	307	350	346	349	352	355	356
95	295	291	295	296	298	300	321	316	314	319	318	318	365	361	364	367	368	369
Black																		
5	107	124	133	131	138	138	144	160	168	170	162	168	172	166	189	182	192	186
10	123	137	147	145	152	152	158	173	180	182	177	180	187	181	202	197	207	202
25	147	159	170	170	174	175	181	194	198	202	199	198	212	206	225	220	230	229
50	174	188	196	196	201	202	207	217	221	226	224	223	240	235	252	252	255	258
75	203	214	223	224	226	228	235	241	244	249	251	247	268	263	280	283	282	285
90	229	236	246	247	248	252	260	262	264	269	272	272	293	289	306	314	308	310
95	244	246	260	260	260	263	275	275	277	283	286	286	310	305	323	329	325	322
Hispanic																		
5	125	127	134	146	143	139	147	166	171	174	180	175	194	178	194	189	197	186
10	140	142	148	159	157	152	161	179	181	185	193	187	208	194	209	204	215	199
25	164	162	173	181	179	176	186	201	202	206	215	207	234	219	232	231	242	226
50	191	191	200	206	205	200	213	226	226	231	238	231	262	248	259	260	273	263
75	219	216	226	233	230	227	240	249	250	256	261	258	290	278	286	293	298	296
90	246	236	252	253	254	251	266	271	270	280	282	277	317	302	310	317	323	321
95	261	246	265	267	265	264	282	285	283	294	292	290	331	321	324	330	339	336

NOTE: Some scores were revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994*, 1996.

Table 19-4 Average science proficiency, by age and parents' highest education level: 1977, 1982, 1986, 1990, 1992, and 1994

Parents' highest education level	Year	Age 9		Age 13		Age 17	
		Percentage of students	Average proficiency	Percentage of students	Average proficiency	Percentage of students	Average proficiency
Less than high school graduate	1977	'9	'198	'13	'224	'15	265
	1982	'6	198	'10	'225	'13	258
	1986	'4	204	'8	229	'8	258
	1990	'5	'210	'8	'233	'8	261
	1992	'4	'217	'6	'234	'8	262
	1994	'4	'211	'6	'234	'7	256
Graduated from high school	1977	'27	223	'33	245	'33	'284
	1982	'15	218	'26	243	'29	'275
	1986	'16	'220	'31	245	'28	'277
	1990	'16	226	'27	247	'26	'276
	1992	'14	222	'23	246	'21	280
	1994	'14	225	'23	247	'22	'279
Some education after high school	1977	7	237	15	260	'17	296
	1982	8	229	17	259	'22	'290
	1986	7	236	16	258	'24	295
	1990	7	238	17	263	'24	296
	1992	8	237	'18	'266	'25	296
	1994	7	239	'17	260	'24	295
Graduated from college	1977	'23	'232	'27	266	'30	309
	1982	'42	'230	'37	'264	'32	'300
	1986	'38	235	'38	264	'37	304
	1990	'40	236	'41	268	'39	306
	1992	'42	'239	'44	269	'43	308
	1994	'45	'238	'46	269	'44	311

^{*}Statistically significant difference from 1994.

[~]Statistically significant difference from 1977.

NOTE: "Percentage of students" represents the percentage of all students in each subgroup. Not shown are approximately one-third of students at age 9 and smaller percentages at ages 13 and 17 who did not know their parents' highest education level.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of American Students in Science, 1969 to 1994; Mathematics 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994*, 1996.

Table 19-5 Average science proficiency scores, by age and grade: 1977, 1982, 1986, 1990, 1992, and 1994

Year	Below modal grade ¹		At modal grade ¹		Above modal grade ¹	
	Percentage	Proficiency	Percentage	Proficiency	Percentage	Proficiency
Age 9						
1977	~24	~197	~75	~227	~1	244
1982	~30	~198	~70	~231	1	266
1986	~34	~205	~66	~234	~0	235
1990	~35	~211	~65	~238	~0	235
1992	~38	~215	~62	~240	~0	248
1994	~33	~215	~66	~239	~0	236
Age 13						
1977	~27	~223	~72	~256	1	285
1982	~28	~229	~72	~258	~0	287
1986	33	~234	67	260	1	266
1990	~36	~240	~63	~264	1	262
1992	~37	~244	~62	~266	~0	313
1994	~38	~244	~62	~264	1	291
Age 17						
1977	~14	~253	75	~295	~11	301
1982	~16	~251	75	~289	~9	~292
1986	17	259	75	~294	~8	299
1990	~22	~260	~70	~299	~8	298
1992	~24	~263	~70	~304	~6	305
1994	~21	~262	73	~302	~6	303

¹The modal grade is the most common grade level for students of a particular age. For example, the

modal grade at age 9 is fourth grade. Nine-year-olds in fifth grade are above the modal grade, and 9-year-olds in third grade are below the modal grade for their age.

²Statistically significant difference from 1994.

³Statistically significant difference from 1977.

⁴Percentages less than 0.5 are rounded to 0.

NOTE: The modal grades are: grade 4 at age 9, grade 8 at age 13, and grade 11 at age 17.

The modal grade is lower for 17-year-olds because of differences in age definition and in the time of year the test is given, causing more students to be above the modal grade at age 17 than at any other age. For a more complete explanation, see the supplemental note to *Indicator 1b*.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994*, 1996.

Table S19-1 Standard errors for table 19-2

Proficiency level	Age	Year					
		1977	1982	1986	1990	1992	1994
Level 350:	9	0.1	0.1	0.1	*0.0	0.1	*0.0
Integrates specialized scientific information	13	0.1	0.1	0.1	0.1	0.1	0.1
	17	0.4	0.4	0.7	0.5	0.7	0.8
Level 300:	9	0.3	0.7	0.5	0.3	0.3	0.4
Analyzes scientific procedures and data	13	0.5	0.7	0.9	0.6	0.8	0.9
	17	0.9	0.9	1.4	1.3	1.5	1.3
Level 250:	9	0.7	1.8	1.4	0.8	1.0	1.2
Applies general scientific information	13	1.1	1.6	1.6	1.0	1.1	1.1
	17	0.7	1.0	1.3	0.9	1.2	1.2
Level 200:	9	1.1	1.9	1.1	0.9	1.2	1.0
Understands simple scientific principles	13	0.7	0.8	1.0	0.7	0.5	0.6
	17	0.2	0.5	0.5	0.3	0.5	0.7
Level 150:	9	0.6	0.7	0.3	0.3	0.3	0.4
Knows everyday science facts	13	0.2	0.1	0.1	0.1	0.1	0.1
	17	*0.0	0.1	0.1	0.2	*0.0	0.1

* Standard errors less than 0.05 were rounded to 0.0.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994*, 1996.

Table S19-2 Standard errors for table 19-3

Percentile	Age 9						Age 13						Age 17					
	1977	1982	1986	1990	1992	1994	1977	1982	1986	1990	1992	1994	1977	1982	1986	1990	1992	1994
All students																		
5	2.3	4.9	1.3	1.3	2.0	1.7	1.7	2.2	2.2	2.0	1.5	1.7	1.3	2.2	2.4	2.3	2.1	4.3
10	2.1	2.6	1.8	1.1	1.8	1.7	1.4	1.8	2.0	1.7	1.3	1.4	1.4	1.9	2.4	2.0	2.5	4.3
25	1.6	2.2	1.3	1.4	1.6	1.6	1.4	1.1	1.3	1.5	1.3	1.3	1.4	2.1	1.9	1.9	2.3	2.0
50	1.1	2.4	1.7	0.9	0.9	1.9	1.2	1.3	1.8	1.2	1.0	0.9	1.0	1.0	1.9	1.3	1.5	1.2
75	1.1	2.0	1.7	0.8	1.0	1.1	0.9	1.5	1.5	0.9	1.0	1.1	0.9	1.6	1.3	1.4	1.3	1.1
90	1.2	3.9	2.0	1.3	1.6	0.9	0.9	1.6	2.0	1.1	1.2	1.7	1.1	1.1	1.9	1.2	1.9	1.5
95	1.2	3.7	1.9	1.4	1.4	1.4	1.5	1.3	1.6	1.9	1.4	1.9	1.3	1.4	2.0	1.5	1.2	1.8
White																		
5	1.3	3.0	2.3	1.4	2.0	2.3	0.9	1.7	2.7	1.6	2.2	1.6	0.9	1.7	2.9	2.3	3.9	4.4
10	1.1	3.1	1.5	1.3	1.5	1.8	1.2	1.7	1.5	1.2	1.6	1.2	0.7	1.5	3.1	2.0	2.5	3.1
25	1.1	2.6	1.5	0.8	1.3	1.2	1.3	1.2	1.9	0.9	1.1	1.1	0.8	1.5	2.0	1.5	2.2	1.7
50	0.9	2.4	1.6	1.0	1.1	1.4	0.8	1.3	2.0	1.1	1.1	1.3	0.7	1.0	1.7	1.2	1.5	1.6
75	0.8	2.0	1.4	1.0	1.3	1.5	0.7	1.1	1.9	1.7	1.2	1.5	0.9	1.6	1.3	1.6	1.7	1.4
90	1.1	2.8	1.7	1.4	1.6	1.0	0.9	1.6	1.9	1.4	1.6	1.8	1.0	1.3	3.0	1.3	1.5	2.0
95	1.9	4.0	2.5	1.3	0.8	2.6	1.1	1.7	2.1	1.3	1.4	2.7	1.4	1.3	2.8	2.0	0.9	4.8
Black																		
5	3.5	11.0	3.2	4.2	4.2	2.7	3.2	3.1	1.7	5.5	3.7	5.9	1.5	3.1	4.8	10.1	4.0	5.0
10	3.4	8.3	3.5	3.8	4.0	3.2	2.4	3.1	2.2	6.1	3.8	5.5	1.9	3.5	4.9	3.1	4.1	3.5
25	2.4	4.9	2.6	2.6	3.5	2.8	2.2	2.4	3.0	3.7	3.6	3.6	1.4	3.2	4.2	4.3	1.7	5.5
50	2.5	5.0	2.2	2.5	3.0	2.3	2.5	1.3	2.8	3.0	2.4	5.3	1.8	3.0	5.9	3.0	3.2	3.1
75	1.8	3.8	1.5	1.7	3.4	3.3	2.6	2.2	3.6	2.6	3.6	4.2	2.0	2.2	3.4	6.0	5.9	5.1
90	2.9	4.7	3.7	2.4	3.0	2.4	3.4	3.5	4.9	4.2	2.7	7.0	2.6	3.9	4.2	11.3	10.3	3.8
95	2.9	3.3	3.5	5.4	4.6	1.6	2.7	1.9	2.5	3.7	7.6	13.3	2.6	1.6	5.8	10.2	8.7	4.5
Hispanic																		
5	7.0	9.6	10.1	5.5	3.0	9.1	3.5	4.9	5.6	4.7	3.7	3.1	5.2	6.1	9.3	6.2	10.5	6.9
10	3.3	16.8	5.2	4.3	3.9	4.1	3.0	4.1	4.5	4.5	6.4	1.8	4.0	7.2	3.8	11.1	14.6	5.7
25	4.3	7.4	3.4	3.7	3.5	3.4	3.5	3.6	5.5	4.1	3.8	3.3	3.9	3.3	5.6	3.6	8.6	7.7
50	3.6	4.8	6.7	3.7	4.1	2.2	2.5	4.4	3.8	3.3	4.5	2.7	2.4	2.5	5.8	5.7	11.0	12.0
75	3.2	3.4	4.1	4.1	2.3	4.8	3.5	5.1	3.4	5.1	3.4	5.0	5.1	3.4	3.6	10.6	2.8	5.7
90	4.9	5.6	5.4	4.4	5.5	6.5	2.0	5.1	3.5	5.9	2.5	7.1	4.4	3.4	7.6	5.1	6.7	5.8
95	6.4	7.6	6.7	6.9	3.5	4.3	4.4	6.1	3.8	2.8	4.2	6.8	4.4	11.0	6.3	9.1	6.0	4.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Irenas in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1996.*

Table S19-3 Standard errors for table 19-4

Parents' highest education level	Year	Age 9		Age 13		Age 17	
		Percentage of students	Average proficiency	Percentage of students	Average proficiency	Percentage of students	Average proficiency
Less than high school graduate	1977	0.4	2.2	0.7	1.3	0.9	1.3
	1982	0.9	6.0	0.6	1.9	0.7	2.4
	1986	0.4	2.9	1.0	2.7	0.4	3.1
	1990	0.4	2.7	0.5	2.1	0.6	2.8
	1992	0.3	2.6	0.5	2.9	0.6	3.8
Graduated from high school	1994	0.4	3.4	0.4	2.5	0.5	4.2
	1977	0.5	1.4	0.6	1.1	0.6	0.8
	1982	1.1	3.3	1.1	1.3	0.9	1.6
	1986	0.7	1.5	1.2	1.4	1.1	2.0
	1990	0.7	1.7	0.8	1.3	1.1	1.4
Some education after high school	1992	0.7	1.9	0.9	1.4	0.9	2.4
	1994	0.6	1.4	0.9	1.2	0.8	1.7
	1977	0.3	1.5	0.5	1.3	0.4	1.1
	1982	0.6	3.2	0.6	1.5	0.6	1.7
	1986	0.6	2.6	0.6	1.4	1.0	2.5
Graduated from college	1990	0.4	2.1	0.6	1.2	0.9	1.6
	1992	0.4	2.4	0.7	1.1	0.9	1.7
	1994	0.4	2.8	0.6	2.0	1.1	1.9
	1977	0.7	1.4	1.0	1.0	1.2	1.0
	1982	2.3	2.3	1.5	1.5	1.4	1.7
	1986	1.1	1.4	2.2	1.9	1.2	2.1
	1990	1.1	1.3	1.2	1.1	1.3	1.7
	1992	1.2	1.2	1.3	1.0	1.4	1.3
	1994	0.8	1.4	1.3	1.3	1.5	1.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994*, 1996.

Table S19-4 Standard errors for table 19-5

Year	Below modal grade		At modal grade		Above modal grade	
	Percentage	Proficiency	Percentage	Proficiency	Percentage	Proficiency
Age 9						
1977	1.0	1.6	1.0	1.2	0.1	6.2
1982	1.9	2.9	1.9	2.2	0.2	13.1
1986	1.7	1.6	1.7	1.2	0.1	10.7
1990	1.4	1.5	1.4	1.0	0.1	9.6
1992	1.2	1.4	1.2	1.0	0.1	16.2
1994	1.3	1.7	1.3	1.3	0.1	14.6
Age 13						
1977	0.9	1.6	0.7	1.0	0.4	3.9
1982	1.3	1.6	1.3	1.3	0.1	8.2
1986	2.1	1.9	2.1	1.3	0.1	6.3
1990	1.3	1.6	1.4	1.0	0.2	17.5
1992	1.1	1.4	1.0	1.0	0.1	14.9
1994	1.3	1.5	1.3	1.1	0.7	24.7
Age 17						
1977	0.6	1.4	0.6	0.9	0.5	1.5
1982	1.0	2.2	1.0	1.1	0.7	2.6
1986	0.9	2.7	1.2	1.6	0.7	4.3
1990	1.0	2.0	1.0	1.0	0.6	2.5
1992	1.1	2.6	1.0	1.2	0.5	4.1
1994	1.6	3.4	1.7	1.3	0.6	4.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in Academic Progress: Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994, 1996*.

Table S19(a) Standard errors for the first text table in Indicator 19

Year	Total			Male			Female		
	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	1.2	1.1	1.0	1.3	1.3	1.2	1.2	1.2	1.1
1973	1.2	1.1	1.0	1.3	1.3	1.2	1.2	1.2	1.1
1977	1.2	1.1	1.0	1.3	1.3	1.2	1.2	1.2	1.1
1982	1.8	1.3	1.2	2.3	1.5	1.4	2.0	1.3	1.3
1986	1.2	1.4	1.4	1.4	1.6	1.9	1.4	1.5	1.5
1990	0.8	0.9	1.1	1.1	1.1	1.3	1.0	1.1	1.6
1992	1.0	0.8	1.3	1.2	1.2	1.7	1.0	1.0	1.5
1994	1.2	1.0	1.6	1.3	1.2	2.0	1.4	1.2	1.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress, *Trends in U.S. Progress: Achievement of American Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994*, 1996.

Table S19(b) Standard errors for the second text table in Indicator 19

Year	White			Black			Hispanic		
	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	0.9	0.8	0.8	1.9	2.4	1.5	—	—	—
1973	0.9	0.8	0.8	1.9	2.4	1.5	—	—	—
1977	0.9	0.8	0.7	1.8	2.4	1.5	2.7	1.9	2.2
1982	1.9	1.1	1.0	3.0	1.3	1.7	4.2	3.9	2.3
1986	1.2	1.4	1.7	1.9	2.5	2.9	3.1	3.1	3.8
1990	0.8	0.9	1.1	2.0	3.1	4.5	2.2	2.6	4.4
1992	1.0	1.0	1.3	2.7	2.7	3.2	2.8	2.6	5.6
1994	1.3	1.0	1.5	1.7	4.2	3.1	2.7	2.4	6.7

—Not available.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment

of Educational Progress, *Trends in U.S. Progress: Achievement of American Students in Science, 1969 to 1994;*

Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994, 1996.

Average science proficiency (scale score), by sex and age: Selected years 1970–92

Year	Total			Male			Female		
	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	'225	255	'305	'228	257	'314	223	253	'297
1973	'220	'250	'296	'223	'252	'304	'218	'247	'288
1977	'220	'247	'290	'222	'251	'297	'218	'244	'282
1982	'221	'250	'283	'221	256	'292	'221	'245	'275
1986	'224	'251	'288	'227	256	'295	'221	'247	'282
1990	229	255	'290	230	'259	'296	227	252	'285
1992	'231	258	'294	'235	260	'299	227	256	'289
1994	'231	257	'294	'232	259	'300	'230	254	'289

¹ Statistically significant difference from 1994.

² Statistically significant difference from 1970 for all racial/ethnic groups except Hispanics. Statistically significant difference from 1977 for Hispanics.

³ Revised from previously published figures.

NOTE: The science proficiency scale has a range from 0 to 500. (See supplemental table 19-1 for detailed explanations of levels.)

Level 150: Knows everyday science facts

Level 300: Analyzes scientific procedures and data

Level 200: Understands simple scientific information

Level 350: Integrates specialized scientific information

Level 250: Applies general scientific information

SOURCE: U.S. Department of Education, National Center for Education Statistics,
National Assessment of Educational Progress, *Trends in Academic Progress*:

Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994, 1996.

Average science proficiency (scale score), by race/ethnicity and age: Selected years 1970–92

Year	White			Black			Hispanic		
	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17	Age 9	Age 13	Age 17
1970	236	263	312	179	215	258	—	—	—
1973	231	259	304	177	205	250	—	—	—
1977	230	256	298	175	208	240	192	213	262
1982	229	257	293	187	217	235	189	226	249
1986	232	259	298	196	222	253	199	226	259
1990	238	264	301	196	226	253	206	232	262
1992	239	267	304	200	224	256	205	238	270
1994	240	267	306	201	224	257	201	232	261

¹ Statistically significant difference from 1994.

² Statistically significant difference from 1970 for all racial/ethnic groups except Hispanics. Statistically significant difference from 1977 for Hispanics.

NOTE: The science proficiency scale has a range from 0 to 500. (See supplemental table 19-1 for detailed explanations of levels.)

Level 150: Knows everyday science facts

Level 300: Analyzes scientific procedures and data

Level 200: Understands simple scientific information

Level 350: Integrates specialized scientific information

Level 250: Applies general scientific information

SOURCE: U.S. Department of Education, National Center for Education Statistics,
National Assessment of Educational Progress, *Trends in Academic Progress*:

Achievement of U.S. Students in Science, 1969 to 1994; Mathematics, 1973 to 1994; Reading, 1971 to 1994; Writing, 1984 to 1994, 1996.